EPA Region 9 Vapor Intrusion Sampling Plan Site-Specific Addendum

Site Name/Location: Middlefield-Ellis-Whisman (MEW) Superfund Area, Mountain View, Santa Clara County, CA

Project Name: MEW OU1 Sewer Pathway Assessment

Anticipated Field Sampling Dates: July 13 – 24, 2020 (5 – 7 days) one-day trips, local travel, no lodging
HAPSITE screening (4 – 5 days); TO15 canister and TO 17 passive sampler deployment (4 – 5 days)

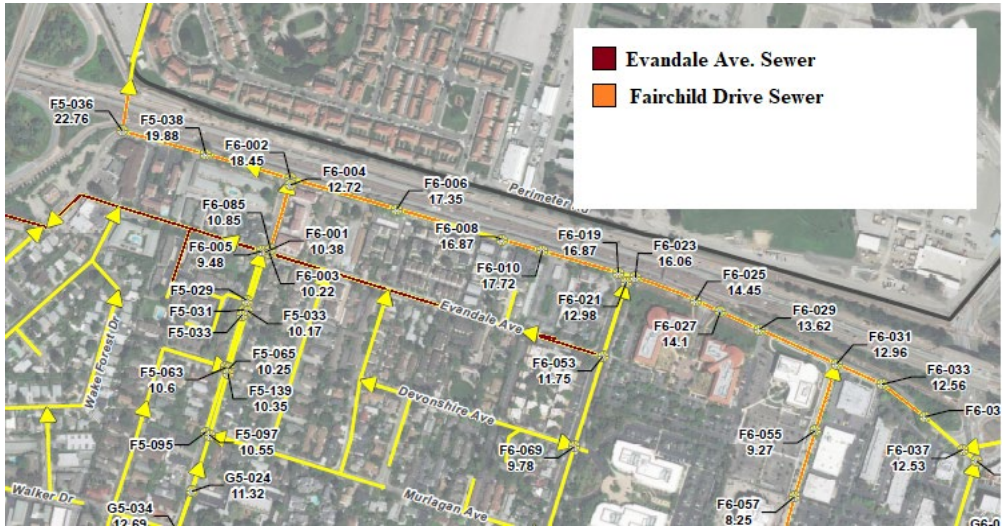
Approvals	Name	Signature	Date
Superfund Project Manager	Alana Lee	Alana Lee	7/8/2020
Region 9 QA Office Reviewer	Lilian Abreu	LILIAN ABREU Digitally signed by LILIAN ABREU Date: 2020.07.14 11:18:57 -07'00'	
Region 9 QA Manager	Audrey L. Johnson	Audrey L Johnson Digitally signed by Audrey L Johnson Date: 2020.07.13 11:34:34 -07'00'	

Project Description and Background

The EPA MEW Superfund site team is conducting a sewer pathway assessment to evaluate the TCE sewer-to-indoor air pathway at the Middlefield-Ellis-Whisman (MEW) Superfund Site in Mountain View, Santa Clara County, CA. High concentrations of TCE vapors (>1,000 micrograms per cubic meter – $\mu g/m^3$) in the Fairchild sanitary sewer main (Fairchild sewer), a 24-to-27-inch pipeline, are entering into a new sewer lateral (an 8-inch line along private street Ariana Place) within the Waverly residential development (former 277 Fairchild Drive property). EPA collected sewer pathway data May 6 – 11, 2020 indicating TCE vapors in the sewer are entering into the sewer cleanouts and in the residential indoor air space of several newly constructed unoccupied homes at concentrations exceeding EPA TCE accelerated (2 $\mu g/m^3$and urgent (6 $\mu g/m^3$) response action levels.

The primary source of TCE in the Fairchild sewer is from the regional MEW shallow TCE groundwater plume infiltrating directly into the Fairchild sewer main due to cracks and sags in the sewer line (bottom of the pipeline ranges between 12.5 feet (at Ellis Street) to 22.7 feet below ground surface (at Leong Drive). TCE was detected in Fairchild line sewage (water) samples at three locations collected March 27-28, 2014 (1) upstream near Ellis Street (1.8 - 7.3 μg/L TCE), (2) near Fairchild Dr/Whisman Rd intersection (29.4 -77.5 μg/L TCE), and (3) downstream at 159 Fairchild Dr (16 - 36 μg/L TCE). Sewer gas samples along Fairchild Drive 2014-2020 have consistently shown TCE concentrations in the low hundreds to low thousands ($\mu g/m^3$) TCE. Other case studies and recent 2020 sewer gas data in the MEW area indicate considerable variability (one to two orders of magnitude) at the sewer lateral and cleanout air such that it is difficult to predict exactly when and where high TCE concentrations will occur and intrude into the indoor air space.

EPA, in coordination with the City of Mountain View, has identified additional properties/buildings with direct sewer connections and laterals to the Fairchild sewer main that may impact over 120 residences and 12 commercial office buildings.



Sanitary Sewer Lines and Flow – MEW Area and Vicinity

Field Staff and Contact Information

Name	Agency/Organization	Project Role	Phone /Email
Alana Lee	EPA R9 Superfund	Project Manager	415.972.3141 / Mobile: 415.317.0406 Lee.Alana@epa.gov
Mathew Plate	EPA R9 QA Office	VI QA Officer/VI Technical Support	415.972.3799 / Mobile: PRVY-Controlled/Privacy Plate.Mathew@epa.gov
Bob Hopeman	EPA R9 FASP	HAPSITE Field Analysis / Sampler	510.412.2388 / Mobile: PRVY-Controlled/Privacy Hopeman.Bob@epa.gov
Junn Masongsong	EPA R9 FASP Contractor - ICF	HAPSITE Field Analysis /Sampler	510.412.2354 / Mobile: PRVY-Controlled/Privacy Junn.Masongsong@icf.com
Ray Chavira	EPA R9 Superfund	Field Sampler / Support	415.947.4218 / Mobile: PRVY-Controlled/Privacy Chavira.Raymond@epa.gov
Michael Schulman	EPA R9 Superfund	Field Sampler / Support	415.972.3064 / Mobile: PRVY-Controlled/Privacy Schulman.Michael@epa.gov
Jess Caldeira	EPA R9 FASP Contractor - ICF	Field Sampler / Support	Jess.Caldeira@icf.com

Conceptual Site Model (select all that apply)

Conceptual Model		Types and approximate number of Sample Location to be Collected (X) / Optional (O)									
X	Vapors are potentially traveling through a preferential pathway (sewer pipe conduit)	X	Main Sewer Air	X	Lateral Sewer Air	X	Sewer Cleanout Air	O	Indoor Air	X	Outdoor Air
X	Site-contaminated groundwater is infiltrating into the Fairchild sewer upstream of manhole F6-010	X	Main Sewer Air	X	Lateral Sewer Air	O	Sewer Cleanout Air	O	Sewer Liquids (sampling by POTW?)		
O	Temporally variable vapor migration through unidentified pathways	O	Continuous Pathway Air	O	Tracer Analysis	O	Pressure Analysis	O	Indoor Air		

Sampling Design (See attached maps for Proposed Sampling Locations)

Sewer Pathway Assessment / Fieldwork connected to Fairchild Trunk

This sewer pathway assessment of all the residential properties with connections and laterals to the Fairchild Trunk is time critical because of the high potential TCE risk of the sewer-to-indoor air pathway with similar conditions as observed at the new residential development at the former 277 Fairchild Drive property.

Scope: TCE screening of all safely accessible sewer manholes along Fairchild Drive and laterals (Wiley Terrace, Sonoma Terrace, Cinnamon Circle, Ariana Place and part of Whisman Road, National Avenue, Tyrella Avenue, Leong Drive) and step-ins/step-outs (sewer cleanouts). TO15 canister and TO17 passive sampling of subset for confirmation and predictive sewer transport modeling impacts.

All sampling will be performed in accordance with the Sampling and Analysis Plan for Indoor Air, Outdoor Air, Treatment System, Sub Surface Soil Gas and Sub-Slab Soil Gas Sampling at EPA Region 9 Superfund Sites, August 2017, prepared by EPA Region 9 Superfund Division, including associated EPA Region 9 Standard Operating Procedures (SOPs).

Contingent Accelerated Response Action / Mitigation Measures: If at any time during the sampling assessment, data indicate the potential for TCE indoor air levels of occupied homes are exceeding the accelerated response action level of 2 ug/m3, air purifiers (air treatment units) on each floor of occupied residences and/or expedited confirmation indoor air may be needed. EPA RPM will notify management, consult with project team, conduct outreach, and implement accelerated response actions, as needed.

Number of and Type of Samples

Type of Sample	Sampling Duration	Analytical Method(s)	Number of Samples		Special Requirements
			Primary	QA Samples Duplicates/Blanks*	
Sewer Gas	Grab 1-7 day Real-Time	TO-15 RAD 130 / TO-17 Chrom / CRD	Up to 10 Up to 50 Up to 60	Duplicate/co-located samples for each analytical method will be collected at a frequency of 10 %	Sample through venthole of manhole cover. Target 2- 3 feet below ground surface using tubing/string/wire.
Sewer Cleanout Gas	Grab 1-7 day Real-Time	TO-15 RAD 130 / TO-17 Chrom / CRD	Up to 10 Up to 50 Up to 120	Duplicate/co-located samples for each analytical method will be collected at a frequency of 10 %	At sewer cleanout with closed cap/lid. Target 6 inches – 1 ft below cap/lid using tubing/string/wire.
Indoor Air	24 hour 3-7 day Real-Time	TO-15 SIM RAD 130 / TO-17 Chrom / CRD	Up to 10 Up to 10 Up to 10	Duplicate/co-located samples for each analytical method will be collected at a frequency of 1 per 10 samples	In currently unoccupied space.
Outdoor Air	24 hour 3-7 day Real-Time	TO-15 SIM RAD 130 / TO-17 Chrom / CRD	Up to 5 Up to 5 Up to 5		For comparative purpose. Representative outdoor ambient air.
Pathway	Grab 24 hour 1-7 day Real-Time	TO-15 TO-15 SIM RAD 130 / TO-17 Chrom / CRD	Up to 5 Up to 10 Up to 10 Up to 10	Duplicate/co-located samples for each analytical method will be collected at a frequency of 10 %	Near potential pathway in currently unoccupied accessible space.

Notes:

*****One field/trip blank per shipment for the Radiello 130 and TO-17 samplers will be collected.

Compounds of Potential Concern, Indicators, and EPA Screening Levels – MEW Area

Compound	Indoor Air Cleanup - Chronic ($\mu g/m^3$)	Indoor Air - Short-term ($\mu g/m^3$)	Sewer Main/Lateral/ Cleanout ($\mu g/m^3$)	Notes
TCE	1	2 (accelerated) 6 (urgent)	>33 Sewer main / Lateral	Step-in/out to nearby sewer cleanouts and manholes
			>20 Sewer Cleanout	Step-out to nearby sewer cleanouts. May recommend sewer gas pre-emptive mitigation and/or expedited confirmation indoor air results
	Potential Pathway Air: >1			Confirmation pathway and indoor air samples if accessible/unoccupied
PCE (optional)	0.4			
Cis-1,2-DCE (optional)	60			Indicator (Site-related attribution)
Trans 1,2-DCE (optional)	60			Indicator (Site-related attribution)
Vinyl Chloride(optional)	0.2			Indicator (Site-related attribution)
Chloroform (optional)				Indicator – sewer / tap water

Special Project Requirements

_____

_____

_____

_____

_____

_____

_____

_____


N
Legend
TCE Detections in Manhole Air Samples
TCE not detected
>ND - 100 µg/m3
>100 - 500 µg/m3
>500 - 1000 µg/m3
>1000 µg/m3
TCE in Shallow Groundwater > 5 µg/L
Estimated
Approximate*
Sewer Main
Sewer Manhole
* Further groundwater investigation is ongoing (2013-2014) to delineate the TCE groundwater plume boundary.
µg/L - micrograms per liter
µg/m3 - micrograms per cubic meter
101
85
Moffett Blvd
Leong Dr
Easy St
Piazza Dr
Evandale Ave
Devonshire Ave
Murlagan Ave
Tyrella Ave
Walker Dr
Sherland Ave
East Middlefield Rd
North Whisman Rd
Fairchild Dr
National Ave
Ellis St
0
500
1,000
2,000
Feet

Legend

- Current Sewer Main
- Direction of Flow
- Sewer Manhole — Manhole ID / Invert depth in feet
- City of Mountain View Boundary

TOEROEK ASSOCIATES, INC.

Sources: Aerial imagery (2017) from ESRI. City boundary, sewer and sewer manhole GIS data obtained from the City of Mountan View. Sewer flow direction from City of Mountain View Sanitary Sewer Maps. [Doc. Nos. 992; 996; 998; 1716; 1717; 1718.]

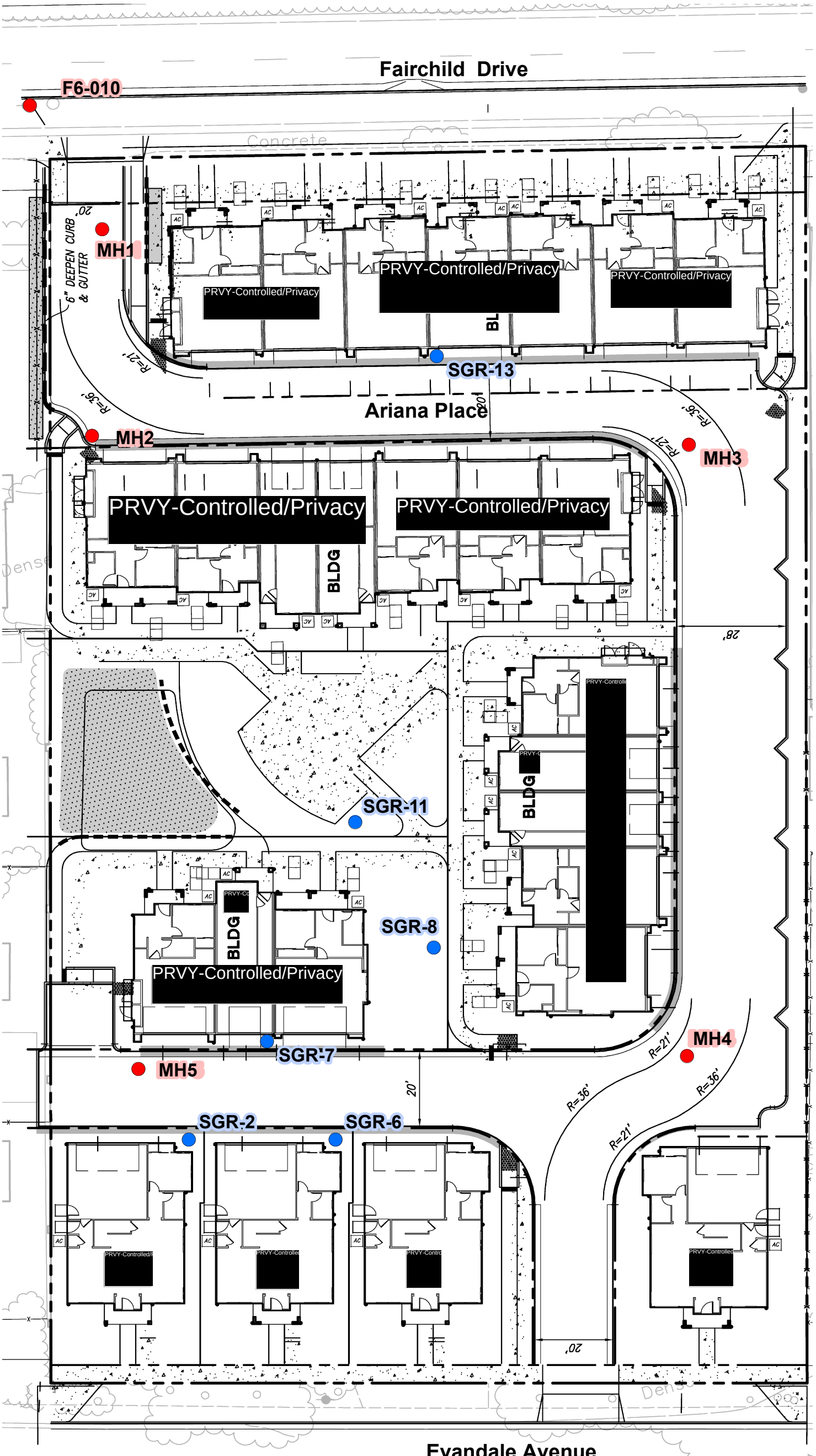
Manhole Elevations for Select Sewer Segments

MEW Superfund Study Area

Mountain View, CA

6/5/2020 Azzolini

S:\EPA SFSS R7-10\Mapping\MEW-Projects\Current Sewer Segment Maps\20200527 Sewer Elevation Maps\20200604_MEW_Sewer Map Invert.mxd



Legend

- Sanitary Sewer Manhole Location (MH)
- Soil Gas Replacement Well Location (SGR)

Notes:
MEW - Middlefield-Ellis Whisman

Data Sources: Google Earth Pro - May 2017

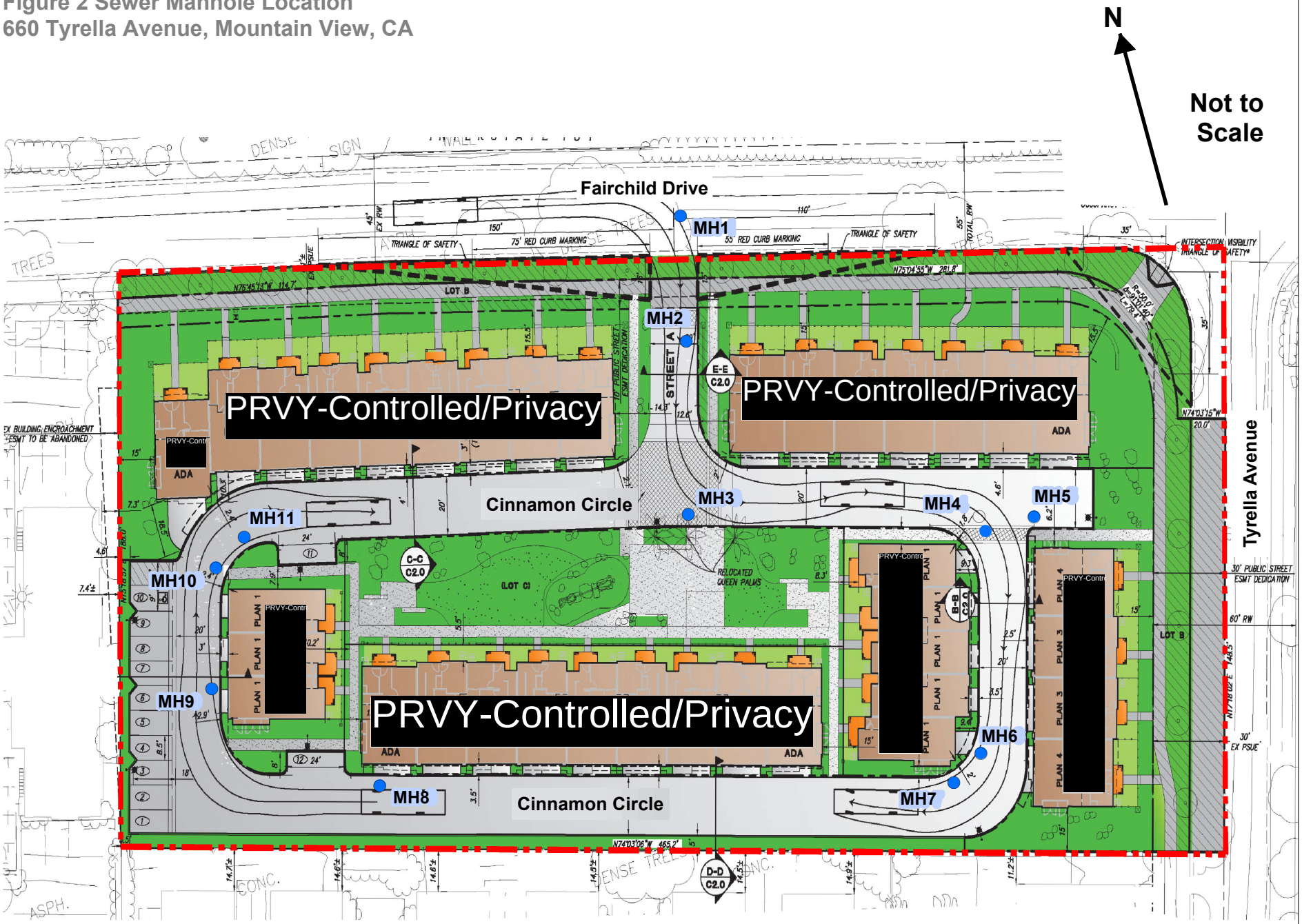
N

0 25 50
feet

EPA Sample Locations
Former 277 Fairchild Drive, Mountain View, CA
MEW Superfund Area

C:\Users\sbusby\Desktop\Fairchild\MXDs\Figure X - EPA Sample Locations_graphic.mxd

Figure 2 Sewer Manhole Location
660 Tyrella Avenue, Mountain View, CA



C:\Users\sbusby\Desktop\Fairchild\MXDs\Figure X - EPA Sample Locations_graphic_660 Tyrella_v2.mxd 6/8/2020 11:50:56 AM EA sbusby

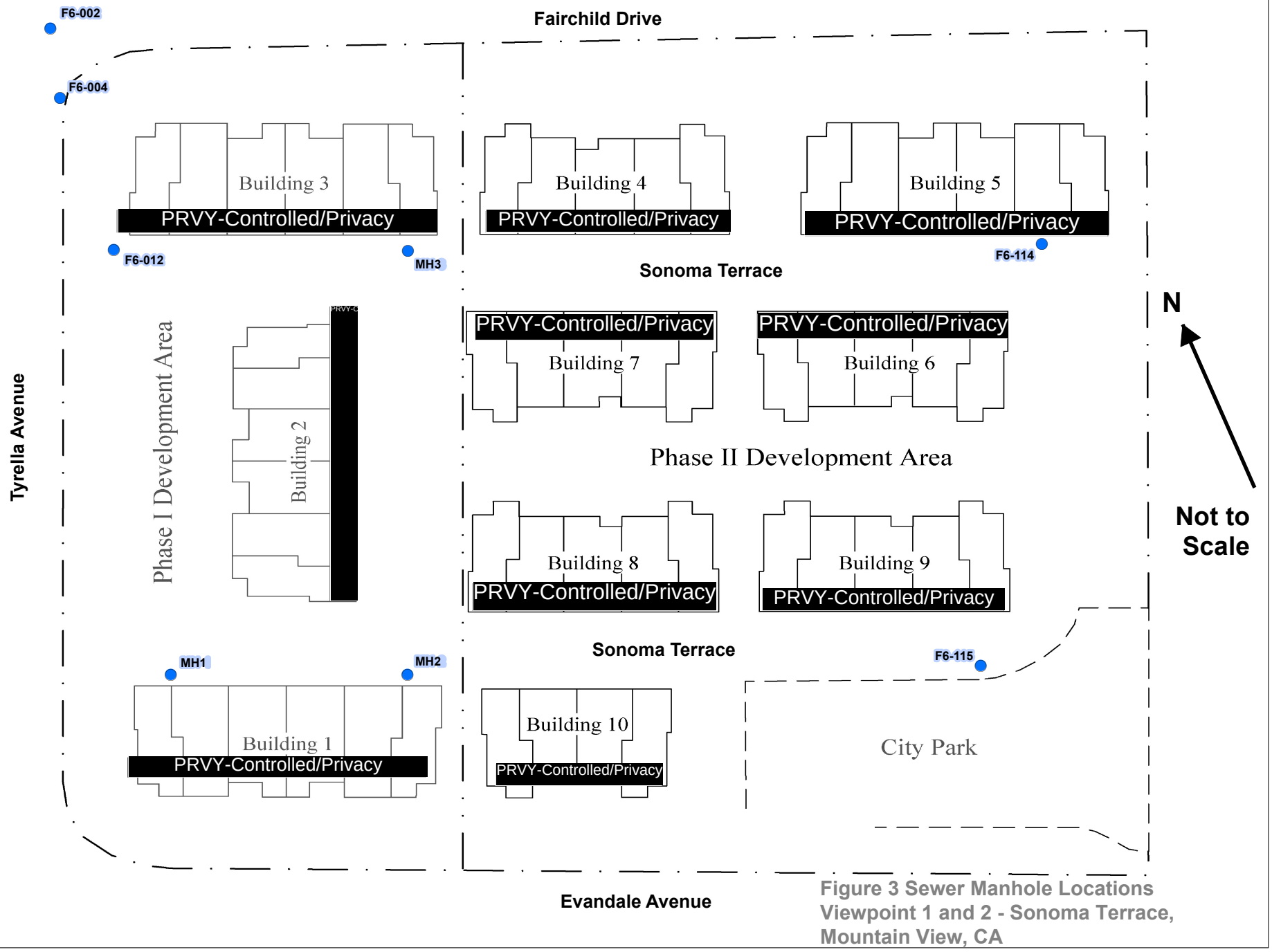
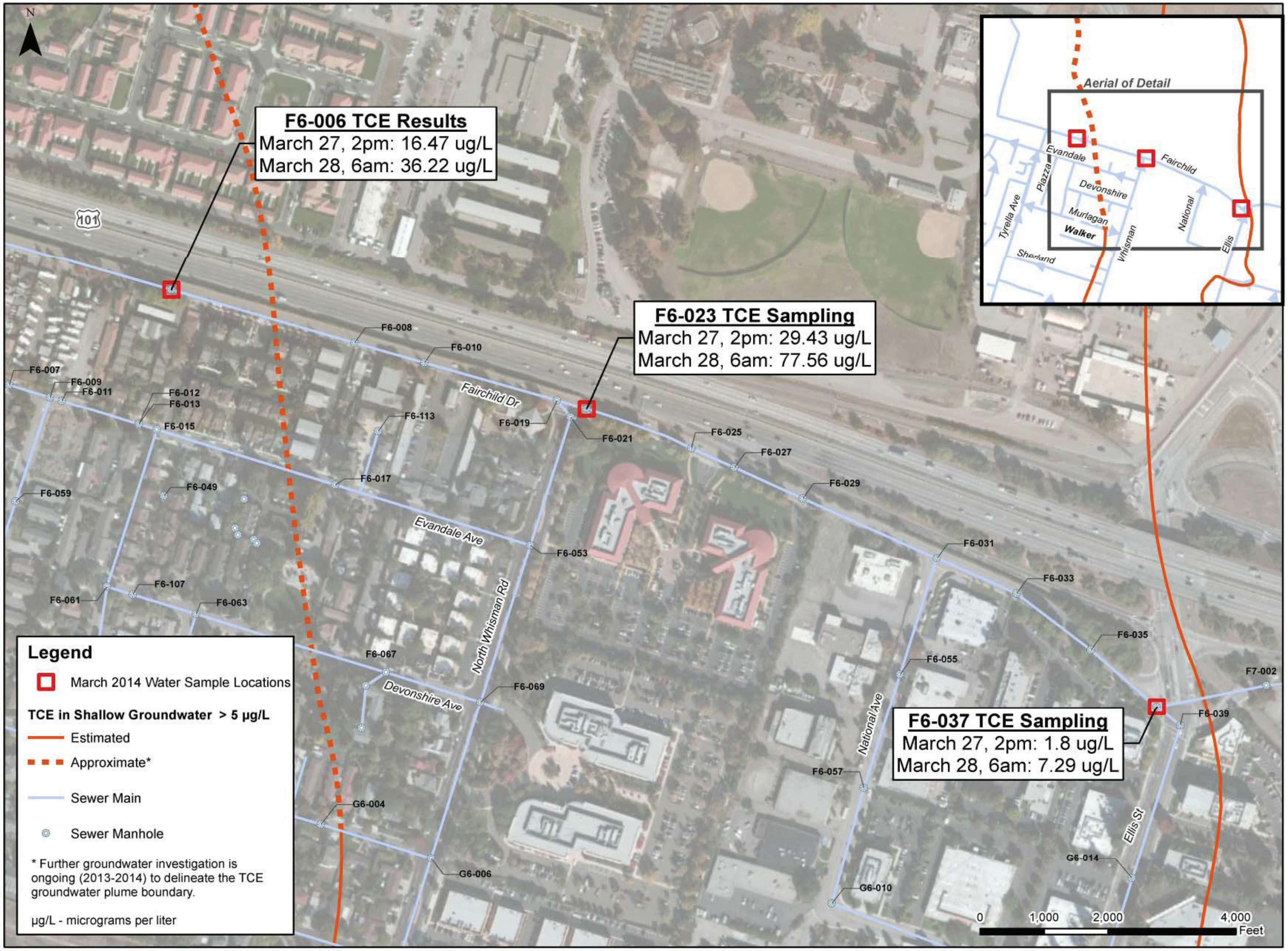
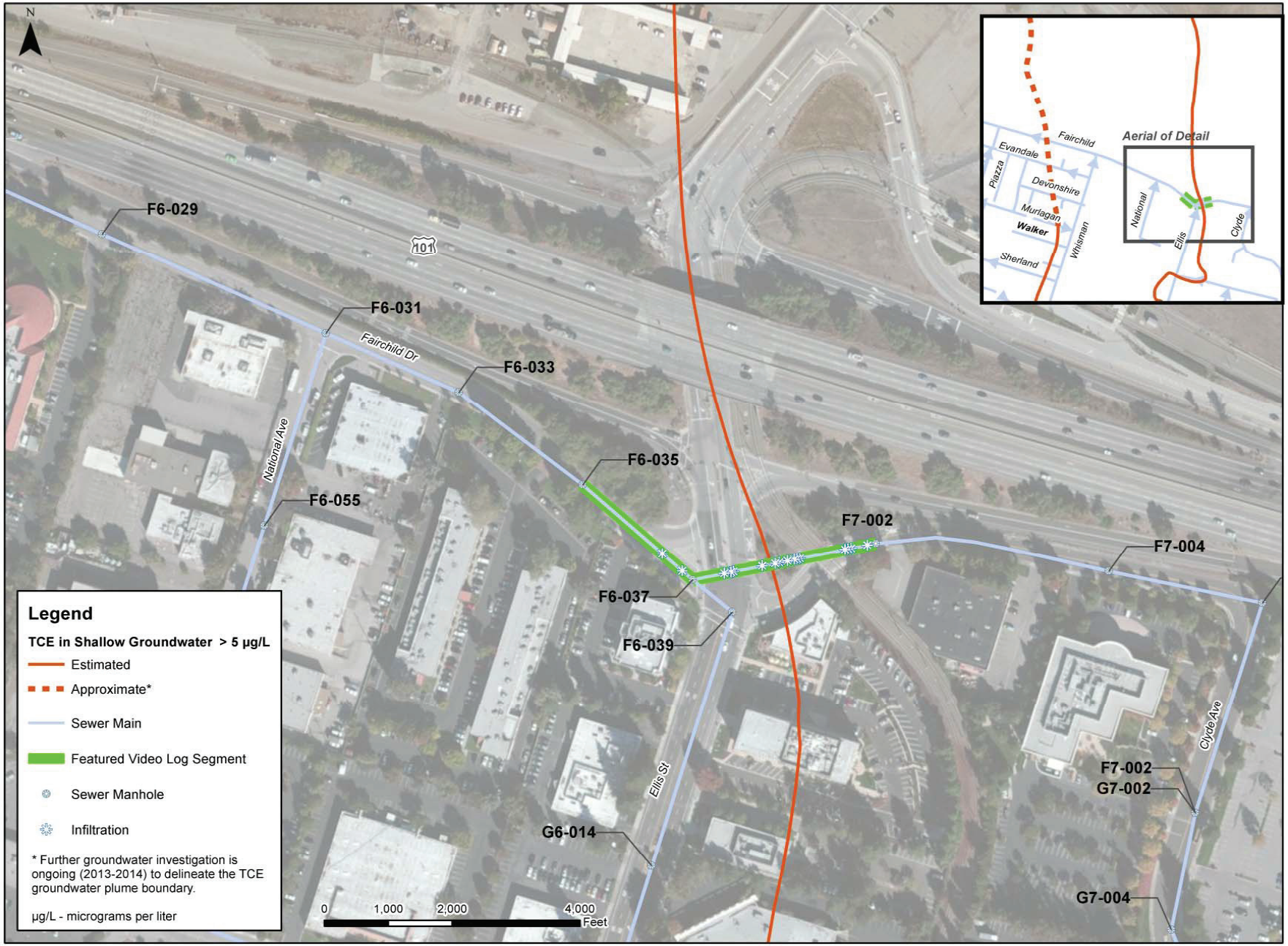


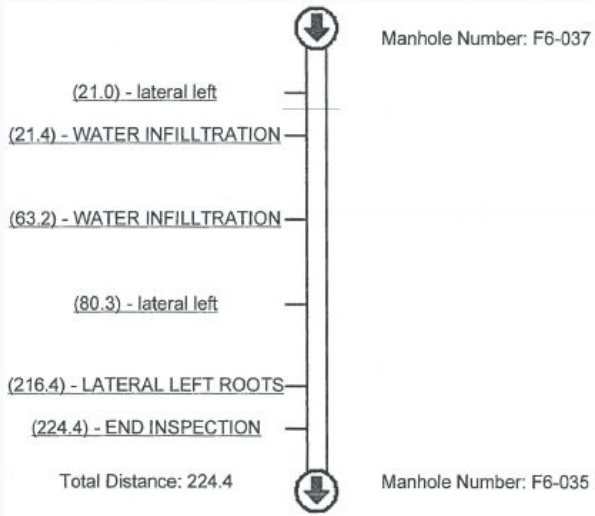
Figure 3 Sewer Manhole Locations
Viewpoint 1 and 2 - Sonoma Terrace,
Mountain View, CA

C:\Users\sbusby\Desktop\Fairchild\MXDs\Figure X - EPA Sample Locations_graphic_Viewpoint_v2.mxd 6/8/2020 11:36:10 AM EA sbusby


N
F6-006 TCE Results
March 27, 2pm: 16.47 ug/L
March 28, 6am: 36.22 ug/L
F6-023 TCE Sampling
March 27, 2pm: 29.43 ug/L
March 28, 6am: 77.56 ug/L
F6-037 TCE Sampling
March 27, 2pm: 1.8 ug/L
March 28, 6am: 7.29 ug/L
101
Fairchild Dr
Evandale Ave
Devonshire Ave
North Whisman Rd
National Ave
Ellis St
F6-007
F6-008
F6-009
F6-010
F6-011
F6-012
F6-013
F6-015
F6-017
F6-019
F6-021
F6-025
F6-027
F6-029
F6-031
F6-033
F6-035
F6-039
F6-049
F6-053
F6-055
F6-057
F6-059
F6-061
F6-063
F6-067
F6-069
F6-107
F6-113
F7-002
G6-004
G6-006
G6-010
G6-014
Aerial of Detail
Evandale
Fairchild
Piazza
Devonshire
Tyrella Ave
Murlagan
Walker
Whisman
National
Ellis
Sherland
Legend
March 2014 Water Sample Locations
TCE in Shallow Groundwater > 5 µg/L
Estimated
Approximate*
Sewer Main
Sewer Manhole
* Further groundwater investigation is ongoing (2013-2014) to delineate the TCE groundwater plume boundary.
µg/L - micrograms per liter
0
1,000
2,000
4,000
Feet


N
F6-029
101
F6-031
Fairchild Dr
F6-033
National Ave
F6-035
F6-055
F7-002
F7-004
F6-037
F6-039
Ellis St
Clyde Ave
F7-002
G7-002
G6-014
G7-004
Aerial of Detail
Fairchild
Evandale
Piazza
Devonshire
Murlagan
Walker
Whisman
Sherland
National
Ellis
Clyde
Legend
TCE in Shallow Groundwater > 5 µg/L
Estimated
Approximate*
Sewer Main
Featured Video Log Segment
Sewer Manhole
Infiltration
* Further groundwater investigation is ongoing (2013-2014) to delineate the TCE groundwater plume boundary.
µg/L - micrograms per liter
0
1,000
2,000
4,000
Feet

Example video: F6-037 to F6-035



DRAFT TCE Results
For Discussion Purposes Only

Sample Location Type

- Sewer cleanout (SC)
- Sanitary Sewer (SS) Manhole (MH)
- Indoor Air (IA)

Sampling /Analysis Method

- AROMA TCE Analyzer
- HAPSITE GC/MS
- Radiello Passive - 3 days - May 8-11, 2020
- **TO15 - Grab / TO15 SIM - 24 hr**

Location ID **XX-YY**

AROMA Data	5/6 11
HAPSITE Data	5/7 10
Radiello Data	ZZ-3d 12
TO15 Data/ TO15 SIM Data	**5/8 8**

Sample Date -

TCE concentration, µg/m3

FAIRCHILD DRIVE